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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/732,115	12/07/2000	Terrance J. Dishongh	42P10041	1363

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EXAMINER

DINH, TUAN T

ART UNIT

PAPER NUMBER

2841

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/01/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

<b>Office Action Summary</b>	<b>Application No.</b> 09/732,115	<b>Applicant(s)</b> DISHONGH ET AL.	
	<b>Examiner</b> Tuan T. Dinh	<b>Art Unit</b> 2841	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 31 October 2006.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-8 and 30-41 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8 and 30-41 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### **Note of claimed language:**

The term "**used to**", which is performed a functional limitation and not a positive limitation. The term "used to" can be equivalent to the limitation of "adapted to or capable of being."

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-2, 4-5, 36-38, 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sandhu (U.S. Patent 6,084,302) in view of Funkenbusch et al, (U.S. Patent 5,108,597).

As to claims 1-2, Sandhu discloses a printed circuit board (substrate 5, column 3, lines 1-2) as shown in figures 1-3 comprising:

a dielectric board member (10, column 3, line 1); and

first and second signal lines (interconnections 15; column 2, line 67) are adjacent and supported on said dielectric board member (10), said first and second signal lines (15) including first and second elongated electrically conductive member that is enshrouded (**covered or surrounded, see specification page 3, line 9**) by carbon-

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based claddings (25, column 4, line 33 to column 5, line 5) over **at least a portion** of an elongated conductive member length, and a thickness (of the conductive member).

Sandhu does not specific disclose the cladding having a carbon concentration greater than 60% by weight.

Funkenbusch et al. teaches a carbon cladding having a carbon concentration greater than 60% by weight, see column 2, line 18 through column 3, line 14.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have a teaching of Funkenbusch et al. employed in the PCB of Sandhu in order to provide an excellent shield and a high level resistance in the PCB.

As to claims 36-38, Sandhu discloses a printed circuit board (substrate 5, column 3, lines 1-2) as shown in figures 1-3 comprising:

a dielectric board member (10, column 3, line 1); and

first and second signal lines (interconnections 15, column 2, line 67) are adjacent and supported on said dielectric board member (10), said first and second signal lines (15) including first and second elongated electrically conductive member that is enshrouded (**covered or surrounded, see specification page 3, line 9**) by carbon-based claddings (25, column 4, lines 60-61, column 5, lines 1-5) over **at least a portion** of an elongated conductive member length, and a thickness of the conductive member.

Sandhu does not specific disclose each of the claddings having a carbon concentration greater than 60% or approximately of 99% by weight.

Funkenbusch et al. teaches a carbon cladding having a carbon concentration greater than 60% or approximately of 99% by weight, see column 2, line 18 through column 3, line 14.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have a teaching of Funkenbusch et al. employed in the PCB of Sandhu in order to provide an excellent shield and a high level resistance in the PCB.

As to claim 4, Sandhu discloses said carbon-based cladding (25) of said second signal line (15) is discontinuous with said carbon-based cladding of said first signal line, see figure 3.

As to claims 5; 40, Sandhu discloses the PCB as shown in figures 1-3 further comprising a second dielectric board member (30, column 5, lines 25-27) disposed above said first dielectric board member (10) and said first signal line (15).

As to claim 8, Sandhu discloses said carbon-based cladding (25) has a dielectric constant that is greater than a dielectric constant associated with said first dielectric board member because the carbon based cladding having carbon and metal which is less resistive, and a dielectric board has a rigid resistance made of dielectric oxide.

3. Claims 30-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Noorily (in the record) in view of Funkenbusch et al, (U.S. Patent 5,108,597).

As to claims 30-32, 34-35, Noorily discloses a carbon-based cladding structure as shown in figure 1 comprising:

a carbon-based cover (32, column 3, lines 23-24); and

a rigid dielectric board member (20, column 3, line 12) having a plurality of conductor elements (26,28,30), at least one of said plurality of conductor elements, which are signal lines fully covered over top, bottom, and side portions thereof with said carbon-based cover (32), see figure 1, said cover of one of the conductive element is connected to another cover of another of the conductive elements, and a second dielectric member (14) located above the cover (32), and a thickness.

Noorily does not specific disclose the cladding having a carbon concentration greater than 60% or 99% by weight.

Funkenbusch et al. teaches a carbon cladding having a carbon concentration greater than 99% by weight, see column 2, line 18 through column 3, line 14.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have a teaching of Funkenbusch et al. employed in the PCB of Noorily in order to provide an excellent shield and a high level resistance in the PCB.

Regarding claim 33, Noority discloses said carbon-based cover has a dielectric constant that is greater than a dielectric constant associated with said dielectric board member.

4. Claims 3, 6-7, 39, 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sandhu in view of Funkensusch as applied to claims 1-2, 4-5, and 8 above, and further in view of Noorily.

Sandhu and Funkenbusch disclose all of the limitations of the claimed invention, except for the cladding of the first signal line being continuous with the cladding of the

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second signal line and each of the claddings being covered greater than 90% of the surface of the first or second signal line (top, bottom, and sides).

Noorily teaches a carbon cladding (32) fully covered to each of signal lines (26, 28, and 30-figure 1).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have a teaching of Noorily employed in the PCB of Sandhu and Funkenbusch in order to provide a fully support, an excellent shield, and a high level resistance to the signal line in the PCB.

### ***Response to Arguments***

5. Applicant's arguments with respect to claims 1-8, and 30-41 have been considered but are moot in view of the new ground(s) of rejection.

Applicant argues:

a) Funkenbusch or Sandhu fails to disclose "a carbon cladding having a thickness **USED TO** tune or adjust an impedance of a signal line/conductor."

Examiner disagrees because the applicant has not claimed any specific structure of the carbon cladding having the thickness that used to tune or adjust the impedance of the signal line. The term "**USED TO**" is described to applicant's functional language and it does not constitute a limitation in any patentable sense. Further, Sandhu discloses the carbon cladding (25) having a thickness that capable of being tune or adjust the impedance to the signal line.

b) Funkenbusch fails to disclose the carbon cladding having a concentration greater than 60% by weight.

Examiner disagrees. Sandhu as modified of Funkenbusch that describes a carbon support material having a concentration of at least 99% weight of Funkenbusch in the carbon cladding of Sandhu in order to provide an excellent shield and a high level resistance in the PCB. Thus, Sandhu in view of Funkenbusch is proper in combination in order to reject the claimed invention.

### ***Conclusion***

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.



Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tuan T. Dinh whose telephone number is 571-272-1929. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Reichard Dean can be reached on 571-272-1984. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

A handwritten signature in black ink, appearing to read 'Tuan Dinh', with a long, sweeping horizontal line extending to the right.

Tuan Dinh  
January 22, 2007.